MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 2, 2016/2017**

## DCT5038 – DATA COMMUNICATIONS AND NETWORKING

(DIT & DBIS)

3 MARCH 2017
9:00 AM – 11:00 AM
( 2 Hours )

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**INSTRUCTIONS TO STUDENTS**

1. This question paper consists of **FOUR (4)** pages.
2. Answer **ALL FIVE (5)** questions.
3. Write all your answers in the **Answer Booklet** provided.

***Instruction: Answer all questions in the Answer Booklet provided.***

**QUESTION 1** **[20 Marks]**

a. Describe what is multipoint (multidrop) connection. Explain how the capacity function within multipoint environment. (3 Marks)

b. *Figure 1* show the components for data communication. Briefly explain on each of component involved. (5 Marks)

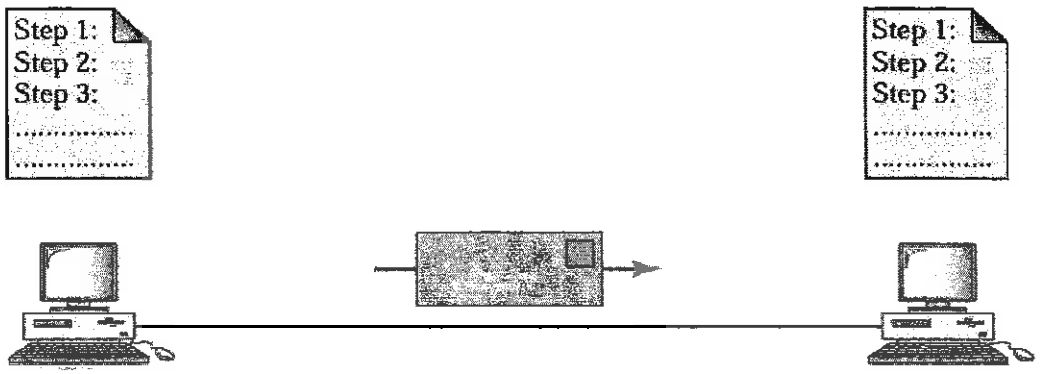


**Figure 1**

c. Briefly describe function provided by any **THREE (3)** OSI layers. (6 Marks)

d. Noise is one of the transmission impairment. Briefly explain any **THREE (3)** types of noise which corrupt the signal. (6 Marks)

**Continued...**

## QUESTION 2 [20 Marks]

a. *Figure 2* shows a Manchester encoding for a digital transmission system.

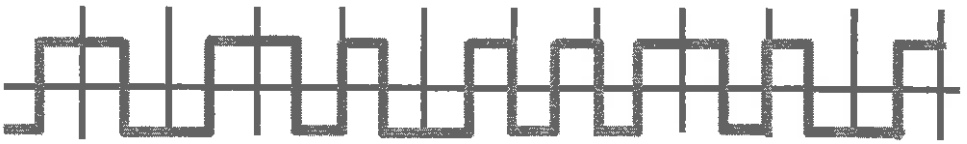

**Figure 2**

(i) Write the bit pattern of Manchester encoding in *Figure 2*. (2 Marks)

(ii) Convert the Manchester encoding into unipolar encoding. (4 Marks)

b. A 32-QAM is used in a digital-to-analog conversion process.

(i) Calculate the number of bits require for one baud? (2 Marks)

(ii) Calculate the bit interval if the baud rate of the network is 2000 baud per second? (2 Marks)

c. Define process **i** until **iv** in Pulse Code Modulation (PCM) as illustrated in *Figure 3* (8 Marks)

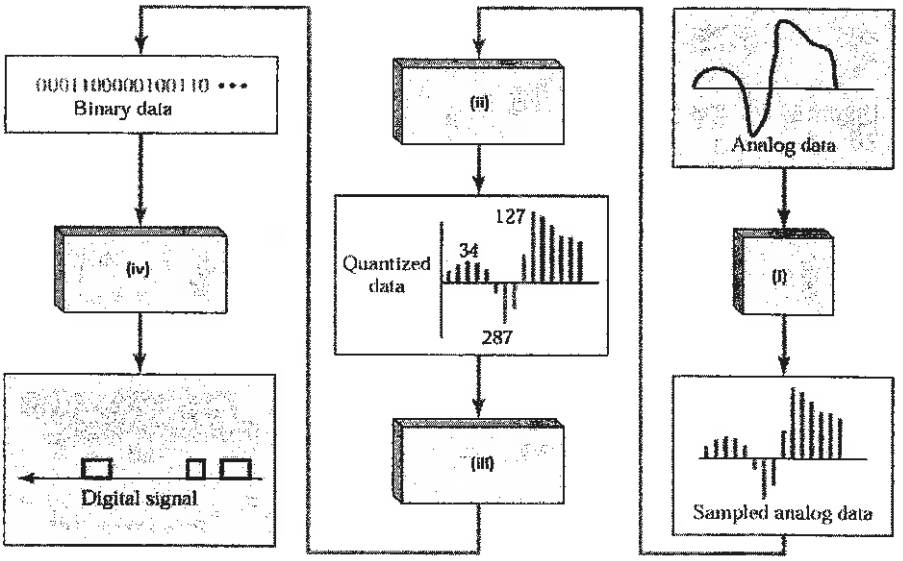


**Figure 3**

d. What is multiplexing? (2 Marks)

**Continued...**

**QUESTION 3** **[20 Marks]**

a. Draw the propagation modes for Multimode step index in Fiber Optic Cable. Show the propagation of light from sources to destination. (6 Marks)

b. Give **FOUR (4)** characteristics of microwave wireless transmission. (4 Marks)

c. Given the codeword 110010111 and the divisor 1100 , use the CRC method to determine whether the codeword is free for error. (6 Marks)

d. Define what is Flow Control and Error Control. (4 Marks)

**QUESTION 4** **[20 Marks]**

a. Draw the frame format for any **TWO (2)** type of High-level Data Link Control (HDLC) of frame. (6 Marks)

b. Show the Stop-and-Wait ARQ in the following situation with diagram.

(i) Normal operation. (3 Marks)
(ii) The frame is lost. (3 Marks)

c. List **TWO (2)** of Ethernet Technology with its data rate. (4 Marks)

d. What is auto-negotiation? What are the purpose of auto negotiation in Fast Ethernet? (4 Marks)

**Continued...**

## QUESTION 5 [20 Marks]

a. Assume that there are 18 devices in a Fast Ethernet LAN. Justify and calculate the bandwidth usable for each device if it is connected via the:

(i) Hub. (2 Marks)
(ii) 3-port bridge. (2 Marks)
(iii) Switch. (2 Marks)

b. What are the advantages of Virtual LAN? (6 Marks)

c. Define **FOUR (4)** characteristics of router. (4 Marks)

d. Draw the bit length of Virtual Path Identifier (VPI) and Virtual Circuit Identifier (VCI) in:

(i) A User-to-Network Interface (UNI). (2 Marks)
(ii) A Network-to-Network Interfaces (NNI). (2 Marks)

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